

<b>CLEC</b>	<b>Service: Market</b>
NEON Optica	<b>ATM/Frame Relay:</b> Washington, DC; Boston, Cambridge, Framingham, Lawrence, Northfield, Springfield and Worcester, MA; Baltimore, MD; Portland, ME; Dover, Keene, Manchester, Nashua and Portsmouth, NH; Newark, NJ; New York and White Plains, NY; Philadelphia, PA; Green Hill and Providence, RI; Bridgeport, Hartford, New Haven, New London, and Stamford, CT
Net2000	<b>ATM/Frame Relay:</b> Baltimore, MD; Boston, MA; Long Island and New York, NY; Newark, NJ; Norfolk and Richmond, VA; Providence, RI; Washington, DC
New Edge Networks	<b>ATM/Frame Relay:</b> Abilene, Amarillo, Beaumont, Brownsville, Bryan, Copperas Cove, Corpus Christi, El Paso, Edinburg, Harlingen, Killeen, Laredo, Longview, Lubbock, Marshall, Mcallen, Midland, Mission, Nederland, Odessa, Pharr, Port Arthur, Sherman, Temple, Tyler, Victoria, Waco, and Wichita Falls, TX; Apple Valley, Arroyo Grande, Atascadero, Atwater, Auburn, Bakersfield, Banning, Baywood Park, Beaumont, Calimesa, Carlsbad, Carmel, Carpinteria, Chico, Davis, Eureka, Fairfield, Fallbrook, Fresno, Goleta, Grass Valley, Hanford, Hesperia, Lodi, Lompoc, Madera, Manteca, Marina, Marysville, Merced, Modesto, Monterey, Morro Bay, Murrieta, Oakdale, Oroville, Palm Desert, Palm Springs, Paradise, Paso Robles, Perris, Placerville, Porterville, Rancho Mirage, Red Bluff, Redding, Salinas, San Luis Obispo, San Marcos, Santa Barbara, Santa Maria, Seaside, Shingle Springs, Sonora, South Tahoe, Stockton, Sun City, Tracy, Tulare, Turlock, Vacaville, Valley Center, Victorville, Visalia, Vista, Watsonville, Woodland, Yuba City, and Yucaipa, CA; Bay City, Benton Harbor, Charlotte, East Lansing, Grand Haven, Holland, Hollister, Holt, Hudsonville, Jackson, Kalamazoo, Lansing, Midland, Niles, Okemos, Oshtemo, Port Huron, Portage, Saginaw, St. Joseph, and Traverse City, MI; Broken Arrow, Claremore, Lawton, Muskogee, Sapulpa, Tulsa, OK; Cabot, Fayetteville, Fort Smith, Jacksonville, Little Rock, Rogers, Russellville, and Springdale, AR; St. Joseph, MO; Carson City, Reno, Sparks, and Sun Valley, NV; De Pere, Green Bay, Madison, Neenah, Sheboygan, and Stoughton, WI; El Dorado, Hutchinson, Manhattan, Salina, and Wichita, KS; Findlay, Holland, Maumee, Middletown, Perrysburg, and Toledo, OH; Kokomo, Lafayette, Michigan City, Mishawaka, and South Bend, IN; Albany, Ashland, Bend, Corvallis, Eugene, Grants Pass, Keizer, Klamath Falls, McMinnville, Medford, Milwaukie, Newberg, Redmond, Roseburg, Salem, and Springfield, OR; Albuquerque, Farmington, Las Cruces, and Santa Fe, NM; American Fork, Brigham City, Cedar City, Clearfield, Kaysville, Logan, Ogden, Orem, Pleasant Grove, Provo, Springville, and St. George, UT; Battle Ground, Bremerton, Camas, Federal Way, Graham, Kennewick, Lacey, Longview, Olympia, Pasco, Port Angeles, Port Townsend, Poulsbo, Pullman, Sequim, Shelton, Silverdale, Spokane, Tacoma, Vancouver, Walla Walla, and Yakima, WA; Ankeny, Cedar Rapids, Davenport, Des Moines, Iowa City, Sioux City, and Waterloo, IA; Anoka, Austin, Bemidji, Blaine, Brainerd, Duluth, Owatonna, Rochester, Shoreview, St. Cloud, and Winona, MN; Aspen, Breckinridge, Carbondale, Durango, Ft Collins, Grand Junction, Glenwood Springs, Greeley, Loveland, Pueblo, Steamboat Springs, and Table Mesa, CO; Augusta, GA; Billings, Bozeman, Butte, Great Falls, Helena, and Missoula, MT; Boise, Caldwell, Coeur D'Alene, Eagle, Idaho Falls, Hayden Lake, Lewiston, Meridian, Moscow, Nampa, Pocatello, Post Falls, Rexburg, and Twin Falls, ID; Bonita Springs, Cape Coral, Cocoa, Cocoa Beach, Daytona Beach, Deland, Destin, Fort Myers, Fort Pierce, Fort Walton Beach, Gainesville, Gulf Breeze, Hobe Sound, Hudson, Jensen Beach, Jupiter, Lakeland, Lehigh Acres, Lynn Haven, Marco Island, Melbourne, Milton, Naples, New Port Richey, New Smyrna Beach, Ocala, Ormond Beach, Pace, Panama City, Pensacola, Plant City, Port Charlotte, Port St. Lucie, Punta Gorda, Sebastian, St. Augustine, Stuart, Tallahassee, Tarpon Springs, Titusville, Vero Beach, and Winter Haven, FL; Bossier City and Shreveport, LA; Casper, Cheyenne, Gillette, Jackson, and Laramie, WY; Fargo, Grand Forks and West Fargo, ND; Flagstaff, Green Valley, Prescott, Sierra Vista, Tucson, and Yuma, AZ; Columbus, Fremont, Kearney, and Omaha, NE; Rapid City, Sioux Falls, SD
NAS	<b>ATM/Frame Relay:</b> Washington, DC; Boston, MA; Baltimore, MD; New York, NY; Philadelphia and Pittsburgh, PA; Norfolk and Richmond, VA; Wilmington, DE

<b>CLEC</b>	<b>Service: Market</b>
Northland	<b>Frame Relay:</b> Auburn, Binghamton, Elmira, Ithaca, Rochester, Rome, Syracuse and Utica, NY
NewSouth Communications	<b>ATM/Frame Relay:</b> Alpharetta, Atlanta, Augusta, Jonesboro, Macon, Peachtree City, and Savannah, GA; Charlotte, Greensboro, Hickory, Raleigh, and Winston-Salem, NC; Baton Rouge, Lafayette, and New Orleans, LA; Biloxi and Jackson, MS; Birmingham, Huntsville, Mobile, and Montgomery, AL; Charleston, Columbia, Greenville, and Myrtle Beach, SC; Chattanooga, Knoxville, Memphis, and Nashville, TN; Daytona Beach, Destin, Fort Myers, Jacksonville, Melbourne, Miami, Orlando, Panama City, Pensacola, Sarasota, Tallahassee, Tampa, and Winter Haven, FL; Lexington, and Louisville, KY
NTELOS	<b>ATM/Frame Relay:</b> Harrisonburg, Lynchburg, Martinsville, New River Valley, Roanoke, Staunton and Waynesboro, VA; Charleston, Clarksburg, Fairmont, and Morgantown, WV. <b>Frame Relay:</b> Huntington, WV
NTS Comm.	<b>ATM/Frame Relay:</b> Abilene, Amarillo, Dallas, Louisville, Lubbock, Midland/Odessa, Pampa, Plainview, San Angelo, San Antonio, and Wichita Falls, TX; Albuquerque, NM; Phoenix and Tucson, AZ
NuVox	<b>ATM:</b> Akron, Cincinnati, Columbus, and Dayton, OH; Indianapolis, IN; Kansas City and Wichita, KS; Little Rock, AR; Oklahoma City and Tulsa, OK; St. Louis and Springfield, MO; Atlanta, GA; Burlington, Charlotte, Greensboro, Raleigh, Wilmington, and Winston-Salem, NC; Columbia, Greenville, and Spartanburg, SC; Knoxville, Memphis, and Nashville, TN; Fort Lauderdale, Jacksonville, and Miami, FL; Lexington and Louisville, KY
Pac-West	<b>ATM/Frame Relay:</b> Bakersfield, Chico, Fresno, Los Angeles, Oakland, Palm Springs, Sacramento, Salinas, San Diego, San Jose, San Luis Obispo, Santa Barbara, and Stockton, CA; Las Vegas and Reno, NV; Denver, CO; Phoenix, AZ; Portland, OR; Seattle and Tukwila, WA; West Valley City, UT
Penn Telecom	<b>ATM/Frame Relay:</b> Butler, Cranberry, Gibsonia, Perrysville, Pittsburgh and Sewickley, PA
Pine Tree Networks	<b>ATM/Frame Relay:</b> Auburn, Lewiston, Portland, Scarborough, South Portland, Westbrook, and Windham, ME
Prospeed.Net	<b>ATM/Frame Relay:</b> Lowell, MA
Reliant Energy	<b>ATM/Frame Relay:</b> Austin, Dallas, and Houston, TX
Rio Communications	<b>ATM/Frame Relay:</b> Bend, Eugene, and Medford, OR
TDS Metrocom	<b>ATM/Frame Relay:</b> Appleton, Beloit, De pere, Fon Du Lac, Fox Valley, Green Bay, Janesville, Kenosha, Madison, Menasha, Milwaukee, Neenah, Oak Creek, Oshkosh, Racine, Stoughton, and Waukesha, WI; Northbrook, Rockford, and Waukegan, IL; Ann Arbor, Battle Creek, Farmington, Grand Haven, Grand Rapids, Holland, Jackson, Kalamazoo, Lansing, and Wayne, MI
Telergy	<b>ATM/Frame Relay:</b> Boston, MA; Albany, Batavia, Binghamton, Buffalo, Glens Falls, Ithaca, New York, Oswego, Poughkeepsie, Rochester, Syracuse, Utica and Watertown, NY; Erie, PA
Teligent	<b>ATM:</b> Cleveland, OH; Dallas and Houston, TX; Chicago, IL; Los Angeles, CA; Hartford, CT; Boston, MA; New York, NY; Philadelphia, PA; Phoenix, AZ; Washington, DC
Time Warner Telecom	<b>ATM:</b> Jersey City, NJ; Albany, Binghamton, New York and Rochester, NY; Austin, Dallas, Houston, and San Antonio, TX; Cincinnati and Columbus, OH; Indianapolis, IN; Los Angeles and San Diego, CA; Milwaukee, WI; Los Angeles and San Diego, CA; Charlotte, Fayetteville, Greensboro, Raleigh-Durham, and Winston-Salem, NC; Chicago, IL; Columbia, SC; Honolulu, HI; Indianapolis, IN; Memphis, TN; Milwaukee, WI; Minneapolis, MN; Orlando and Tampa, FL
TXU Comm.	<b>ATM/Frame Relay:</b> Austin, Corpus Christi, Dallas, Fort Worth, Huntsville, Nacogdoches, San Antonio, Temple, Tyler, and Waco, TX

<b>CLEC</b>	<b>Service: Market</b>
US LEC	<b>ATM/Frame Relay:</b> Philadelphia and Pittsburgh, PA; Norfolk and Richmond, VA; Atlanta, GA; Baltimore, MD; Birmingham and Mobile, AL; Charleston, SC; Charlotte, Greensboro, and Raleigh, NC; Chattanooga, Knoxville, Memphis, and Nashville, TN; Ft. Myers/Naples, Jacksonville, Miami, Orlando, and St. Petersburg, FL; Louisville, KY; New Orleans, LA; <b>ATM:</b> Washington, DC; Virginia Beach, VA; Huntsville, Montgomery, and Tuscaloosa, AL; Hickory and Wilmington, NC; Johnson City, TN; Daytona Beach, Fredericksburg, Ft. Lauderdale, Gainesville, Tampa, and West Palm Beach, FL
Vanion	<b>ATM/Frame Relay:</b> Colorado Springs, CO
WanTel	<b>ATM/Frame Relay:</b> Roseburg, OR
Western Integrated Networks	<b>ATM/Frame Relay:</b> Sacramento, CA
WinStar/IDT	<b>ATM/Frame Relay:</b> Austin, Dallas, Fort Worth, Houston, Irving, San Antonio, and Sunnyvale, TX; Chicago, and Oak Brook, IL; Cincinnati, Cleveland, and Columbus, OH; Detroit, MI; Long Beach, Oakland, Sacramento, San Diego, and San Francisco, CA; Indianapolis, IN; Kansas City and St. Louis, MO; Las Vegas, NV; Milwaukee, WI; Oklahoma City and Tulsa, OK; Stamford, CT; Atlanta, GA; Baltimore, MD; Birmingham, AL; Boise, ID; Boston, MA; Charlotte, NC; Chattanooga, TN; Denver, CO; Flagstaff, Phoenix, and Tucson, AZ; Honolulu, HI; Jacksonville, Miami, Orlando, and Tampa, FL; Long Island and New York, NY; Newark, NJ; Norfolk, VA; Philadelphia, PA; Portland, OR; Minneapolis and Saint Paul, MN; Salt Lake City, UT; Seattle and Spokane, WA; Washington, DC. <b>ATM:</b> Los Angeles, CA
WorldCom	<b>ATM/Frame Relay:</b> Washington, DC; Acton, Boston, Cambridge and Springfield, MA; Manchester and Nashua, NH; Laurel Springs, New Brunswick, and Newark, NJ; Buffalo, Garden City, Manhattan, New York, Westbury and White Plains, NY; King of Prussia, Philadelphia, and Pittsburgh, PA; Providence, RI; Reston, VA; Austin, Dallas, Houston, Irving, Richardson, and San Antonio, TX; Anaheim, Bakersfield, Fresno, Hayward, Irvine, Los Angeles, Rancho Cordova, Redwood City, Sacramento, San Diego, San Francisco, San Jose, Santa Clara, Stockton, Sunnyvale, and West Sacramento, CA; Bensenville, Chicago, and Elk Grove Village, IL; Cincinnati, Cleveland, and Toledo, OH; Detroit, Grand Rapids, Holland, Lansing, Southfield, Traverse City, and Zeeland, MI; Hartford and Stamford, CT; Indianapolis, IN; Kansas City, St. Louis and Springfield, MO; Oklahoma City, Stillwater, and Tulsa, OK; Little Rock, AR; Milwaukee, WI; Reno, NV; Albuquerque, NM; Baltimore, MD; Atlanta, Georgia, Jonesboro, and Marietta, GA; Aurora and Denver, CO; Jackson, MS; Kirkland and Seattle, WA; Knoxville and Memphis, TN; Maplewood, Minneapolis, and Saint Paul, MN; Miami, Orlando, Pompano Beach, and Tampa, FL; Morrisville, NC; Phoenix and Tucson, AZ; Portland, ME; Portland, OR; Salt Lake City, UT
XO	<b>ATM:</b> Washington, DC; Boston, MA; Baltimore, MD; New York, NY; Philadelphia, PA; Akron, Cleveland and Columbus, OH; Austin, Dallas, Houston, San Antonio, TX; Chicago and Wood Dale, IL; Detroit, MI; Las Vegas, NV; Long Beach, Los Angeles, Roseville, Sacramento, San Diego, San Francisco, and Santa Ana, CA; St. Louis, MO; Atlanta, GA; Newark, NJ; Couer D-Alene, ID; Denver, CO; Miami and Tampa, FL; Minneapolis and Saint Paul, MN; Phoenix, AZ; Portland, OR; Salt Lake City, UT
<i>Sources: See Appendix M.</i>	

## APPENDIX J. ADDITIONAL INFORMATION ON SOFTSWITCHES

**Table 1. Features of Packet Switches/Softswitches vs. Traditional Circuit Switches**

<b>Less fixed investment</b>	<ul style="list-style-type: none"> <li>• “Currently a Softswitch costs 40% to 45% less than an equivalent circuit switch.”</li> <li>• “Originally envisioned to replace the monstrous Class 5 switches, softswitch platforms, by recent estimates, can be as much as 20 times smaller physically and 10 times cheaper.”</li> <li>• CLEC DixieNet “found that for ‘10 percent’ of the cost of traditional class 5 equipment, it could accomplish everything the firm intended to do with a switch through softswitch technology.”</li> <li>• TelePacific Communications: “With the new convergent systems, we will be able to move into new service areas in weeks rather than months and add new services instantly rather than wait for months for vendors to enhance their switches.”</li> </ul>
<b>Less expensive to operate and maintain</b>	<ul style="list-style-type: none"> <li>• “Carrying voice traffic on a packet platform saves up to 70% in operating costs, by [Banc of America] estimates.”</li> <li>• “In addition to providing its customers with 10-25 percent cost reductions on local voice service, the new architecture provides CTC with higher margins – about 50 percent, versus the 10-30 percent margin afforded by CTC’s former resale business.”</li> <li>• “New business models based on the use of IP-oriented switches have an infinitely better value proposition for carriers. . . . They’ll enable gross margins in the 60 percent-plus range and the ability to provide differentiated offerings.”</li> <li>• DixieNet: “Other switch-related expenses – operation, maintenance, power, air conditioning, vendor support, training expenses, the cost of upgrades – all the costs were significantly lower with the softswitch system.”</li> <li>• BroadRiver: “you get all the functionality of a basic class 5 type of switch in about a tenth the floor space for about a third the power. ”</li> <li>• “A majority of the cost savings is derived from Sonus’ dramatically smaller footprint. A circuit-switched network requires roughly 40 bays of equipment to simultaneously switch 50,000 calls. Sonus’ packet-based platform is capable of switching the same number of calls with just two 19-inch racks of equipment.”</li> </ul>
<b>Reduced peripheral equipment needs</b>	<ul style="list-style-type: none"> <li>• WorldCom: these new switches “provides input for IP, frame relay, ATM and voice all in a single box. We no longer have the need of putting out an IP router, an ATM switch, a frame relay switch and a voice switch. We do it all with the Multi-Services Switch. We can get a capital reduction because of a single box versus many boxes. And secondly, we get a trunking efficiency because now we only have to trunk back one box versus multiple boxes. That capital efficiency improvement is anywhere from 50-75%.”</li> </ul>
<b>Increased scalability</b>	<ul style="list-style-type: none"> <li>• Allegiance: “The traditional switch with its time-space-time architecture is constrained. By deploying networks of media gateways which use standardized packets, new more-scalable networks are possible.”</li> <li>• XO: Softswitch technology will allow XO to realize cost savings both in reduced equipment cost and reduced physical co-location space needs. Additionally, softswitches are expected to be quickly scaleable and have capabilities to launch new and enhanced services.</li> </ul>
<b>Increased flexibility for new services</b>	<ul style="list-style-type: none"> <li>• “Network intelligence in data networks offers carriers opportunities to offer differentiated, value-added enhanced services regardless of transport method.”</li> <li>• Electric Lightwave: “Another key concept in the softswitch model is the ability to quickly provide new services and applications.”</li> <li>• “Softswitches have greater flexibility. Legacy switches . . . contain a lot of proprietary code, whereas softswitches are easier to customize, enabling service providers to develop a wider variety of services and create new revenue streams.”</li> </ul>
<b>High quality and reliability</b>	<ul style="list-style-type: none"> <li>• “With technologies currently available, it is possible to obtain quality voice calls over dedicated IP data networks.”</li> <li>• “Because it is truly a Central Office in a single system, the FUSION 5000 passed all platform tests with flying colors in the first attempt and is approved for general deployment in service provider central offices throughout the country.”)</li> <li>• “Now soft switches like that of Lucent can do between 144,000 and 5.25 million busy-hour call attempts, which is in the neighborhood of what a PSTN Class 5 can do.”</li> <li>• BroadRiver: “‘I would even say that the flexibility associated with this type of approach and technique gives you better survivability and reliability . . . The flexibility in terms of being able to dynamically switch and route traffic . . . is very open and very flexible,’ Buttermore said. ‘From a problem-resolution perspective, that’s great.’”</li> </ul>
<i>Sources: See Appendix M.</i>	

**Table 2. The Emergence of Softswitches**

- “At first used only for limited functions, in the past 12 months, softswitches have emerged as a possible alternative to the traditional class 5 devices at a number of small carriers.”
- “[I]t is fair to say that CLECs are about to graduate from Class 5 to a new generation of multiservice platforms-capable of carrying Internet protocol (IP) and circuit-switched traffic and consolidating functions that previously were supported in separate, standalone devices.”
- “Nobody doubts that the new switches will eventually overtake the current products. . . . ‘The benefits that the new switches offer are so enticing that all carriers eventually will incorporate them in their networks.’”
- “a CLEC today is unlikely to buy a Class 5 switch for a new buildout in a city . . . and will likely go with a softswitch solution.”
- “Only a few short years ago, any company that wanted to get into the facilities-based telecom market had only one choice: The heavy, expensive, inflexible and complex class 5 switch, the technology that has driven telecommunications for decades. . . . In the past few years, a new option has emerged. It’s less expensive, more capable of adding new features, much smaller and easier to run: The humble softswitch.”

*Sources: See Appendix M.*

**Table 3. CLECs Deploying Softswitches**

<b>CLEC</b>	<b>Softswitch Deployment</b>
Allegiance	"announced today the official deployment of softswitch technology as a complement to its existing network infrastructure. . . . will now be able to utilize packet switching - in addition to the traditional circuit-switched technology already deployed in its 21 U.S. markets."
Broadriver	"using Cisco BTS 10200 softswitches and 2400 series integrated access devices (IADs) . . . launched VOIP-based converged voice, data and Internet service in Atlanta, Nashville and Orlando, and announced plans to expand service into Charlotte, Ft. Lauderdale, Miami and St. Petersburg by year's end." Tom Buttermore, CEO of Alpharetta, Ga-based competitive-communications firm BroadRiver Communications, said the advent of softswitches was the main reason his company was formed.
CTC Communications	"By introducing softswitch technology into its network, CTC will only lease T1 (1.5-megabit-per-second) loops from the incumbents, providing the intelligence for basic and enhanced voice services on its own." CTC "built its own facilities-based network, without installing any circuit switches, in 1999," but instead has used a combination of softswitches and ATM switches.
Global NAPs	Global NAPS has reportedly "gone so far as to deactivate four class 5 switches and deploy 35 softswitches, with 40 more in the pipeline as substitutes."
KMC Telecom	"Lucent's Softswitch IPO allows us to protect our switching infrastructure, save on real estate and reduce expenses without deploying costly circuit switches. . . . Now, we can deploy more telecom ports per square foot in a cost-effective manner."
Level 3	"By deploying Sonus' IP technologies into our network, we can deliver new services more rapidly and cost-effectively than we could before."
NewSouth Communications	"Tekelec's softswitch will provide long-distance service to NewSouth's customers in a nine-state coverage area."
Time Warner Telecom	"has deployed Sonus' packet telephony product family, including softswitches and media gateways, in eight markets throughout the United States . . . [and] is now delivering revenue-generating traffic over those networks."
USA Datanet	"selected the Sonus Packet Telephony suite, including the . . . PSX6000 SoftSwitch . . . as the platform for its next-generation VoIP network."
WorldCom	"WorldCom is taking the softswitch route and will deploy six of the devices by year-end [2001] . . . The new switches handle dial-up Internet traffic more cost-effectively than traditional Class 5 switches and have the capability to do voice over IP."
XO Communications	"plans to use the Sonus Networks platform, which includes . . . the PSX6000 SoftSwitch . . . The system is expected to act as an integral piece of XO's future network foundation, and will support a full range of local, long distance and Internet services to enterprise customers."
Kancharla	"VocalData Inc., a leader in the service delivery softswitch market, today announced that Kancharla Corp., a leading competitive local exchange carrier based in Huntsville, Ala., has purchased and deployed VocalData's award-winning VOISS (Voice Over IP Softswitch) solution."
Go-Comm	"VocalData Inc., the technology leader in the service delivery softswitch market, today announced that its award-winning Voice Over IP Softswitch (VOISS) solution has been deployed by Go-Comm, Inc. to provide voice over IP services in the Dallas area."
<i>Sources: See Appendix M.</i>	

<b>Table 4. Major Softswitch Manufacturers</b>		
<b>Manufacturer</b>	<b>Softswitch Product</b>	<b>Description</b>
Tachion	Fusion 5000	"will be used by our service provider customers as an alternative to traditional legacy central office composed of a class 5 voice switch surrounded by a number of data devices"; "collapses all the functions of the telephone company's central office into a box the size of a dorm room refrigerator"; It starts at around \$270,000 compared to up to \$2 million for a traditional Class 5 circuit switch.
Axtar Limited	OneSwitch	"supports both circuit switched interfaces such as TDM (E1 or T1) as well as IP (Ethernet) network interfaces," and is "a complete replacement for a CLASS 5 or CLASS 4 central office switch and can be implemented on its own as the primary (core) switch in a small network or as an edge switch for larger networks."
Santera Systems	SanteraOne	"an all-in-one C.O. solution that integrates the entire next-generation switching solution within a single chassis. This all-inclusive solution offers CLASS 4 and CLASS 5 functionality, ATM, IP, TDM, and frame relay switching, signaling, media gateways and controllers, and IP routing."; "costs about as much as what you'd spend on the switch room for a Class 5 switch"; "can be a replacement for either a legacy Class 4 or Class 5 circuit switch"
Uniphore Networks	BroadSoft	In March 2001, "completed Class 5 customer trials of its BroadSoft platform."
Cisco	BTS 10200	"has been in a GA [generally available] state for about eight months." It is "being upgraded to its second release of software. It supports a substantial number of business voice calling features, making it one of the front runner contenders for Class 5 replacement opportunities. It also implements all mandatory Class 5 and core network switch features, such as 911, LNP, DAOS, SS7, AIN application access, etc."
Sonus	GSX9000	"a carrier-class switch that is currently capable of supporting roughly 100,000 simultaneous calls while maintaining 99.999% reliability. One of the benefits of the GSX9000 is the small footprint needed for deployment; Sonus' GSX9000 reduces the required C.O. space by roughly 90% compared to traditional circuit-based switches. This greatly reduces the cost of deployment, which management estimates to be roughly 50% of per-port costs and 45% of operating costs."; "Our switch is ready for prime time because it's already widely in deployment, mostly in Class 4."
Convergent Networks	Integrated Convergence Switch (ICS)	Convergent Networks is "expected to have a softswitch with Class 5 functionality available this quarter.
Tacqua	Open Compact Exchange (OCX)	"Class 5 alternative switching system with integrated Softswitch functionality providing a clear migration path to next-generation packet-based networks."
Nortel	Communication Server 3000	"New venture capital startups with little or no telephony experience can use this solution as an entry-level vehicle to the Voice-over-IP market – supporting next generation line-side services."
Syndeo Corporation	The Syion 426	"The Syion 426 is a powerful second-generation, carrier-grade CLASS 5/Local Exchange softswitch"; "The Syion architecture was purpose-built for the delivery of regulatory (primary local exchange) services such as emergency/lifeline services, operator services, directory assistance, and lawful intercept." In February 2002, The Armstrong Group, which operates telephone and cable networks in the eastern U.S., announced that it would deploy the Syndeo Syion 426 softswitch platform in Western Pennsylvania.
Convedia Corporation	Convedia CMS-6000 Media Server	"The Convedia CMS-6000 Media Server has been designed and developed specifically to meet the challenges of delivering enhanced voice and video services over packet networks. . . . Convedia's modular hardware and software architecture lets you enter the enhanced services market quickly and affordably."

<b>Table 4. Major Softswitch Manufacturers</b>		
<b>Manufacturer</b>	<b>Softswitch Product</b>	<b>Description</b>
Gallery IP Telephony	CAssiopeia Softswitch Class 5 Alternative	"CAssiopeia Softswitch is the first ever standard-based Class-5 softswitch to demonstrate high-reliability, high capacity and performance, great flexibility and scalability, primary line architecture, revenue-generating services and features platform, and open standards interfaces. It enables service providers to reap the benefits of IP Telephony better, faster and cheaper."
MetaSwitch	Meta MetaSwitch VP3000	"The Meta MetaSwitch VP3000 Broadband Voice Platform Switch Platform . . . provides a full range of Class 5 services without a legacy Class 5 switch. . . This feature set makes the VP3000 ideal for service providers seeking to: generate additional revenue from data lines (such as DSL) by adding high-revenue voice; services; expand into new geographical regions, where backhauling long distances to their existing; facilities may be overly complex and expensive; add next-generation Class 5 services to their network, either replacing existing Class 5; switches or as existing capacity is exhausted; build an entirely green-field network providing broadband voice and data and/or POTS voice using a single switching platform."
Lucent	Softswitch – T3	Will "offer Voice over Packet Connectivity for toll/tandem (Class 4) functions . . . will include core revenue generating voice services . . . running in a converged-voice/data-network."
VocalData	VOISS	"The VOISS solution is a feature-rich service delivery softswitch that enables service providers to offer carrier-grade voice services and enhanced applications on an open architecture."
<i>Sources: See Appendix M.</i>		



## APPENDIX K. CLEC NETWORKS BY MSA

This appendix tabulates the number of CLEC networks in the 150 largest Metropolitan Statistical Areas (MSAs). It is based on the CLEC reports prepared by New Paradigm Resources Group (NPRG).

The data for 2001 are from NPRG's latest report – the *CLEC Report 2002* – which describes CLEC networks as either “Operational,” “On-Net,” “Resale,” or “Planned.” We have tabulated only Operational and On-Net networks, both of which appear to involve the use of a CLEC's own facilities. CLECs operating On-Net networks are indicated in italics.

The data for 1998 are based on NPRG's *CLEC Report 1999*, which describe CLEC networks as either “Operational,” “Off-Net,” or “Planned.” We have counted both “Operational” and “Off-Net” networks in the 1998 totals. CLECs operating “Off-Net” networks are indicated in italics.

In some MSAs, the total number of Operational and On-Net networks exceeds the number of CLECs operating within those MSAs. This is due to the fact that, in some instances, individual CLECs operate multiple networks within the same MSA.

The 2001 totals include the networks of CLECs that have declared bankruptcy. Most such CLECs are still operational (and some are now emerging from bankruptcy). Moreover, network facilities such as fiber are a sunk investment, so if one company ceases to use its network it is highly likely that another company will quickly seize the opportunity to do so (and will probably be able to obtain the facilities at a fire-sale price). In any event, networks operated by CLECs that have declared bankruptcy (as of March 31, 2002) represent no more than 18 percent of the totals counted here.

MSA	CLEC Networks – 1998	CLEC Networks – 2001
1. Los Angeles-Long Beach, CA	<p>Allegiance Telecom; AT&amp;T; Electric Lightwave; FirstWorld Communications; Focal; Global NAPs; GST Telecommunications; ICG Communications; Intermedia; Level 3 Communications; <i>MediaOne Telecommunications</i>; MGC Communications; <i>Net-Tel Corporation</i>; NEXTLINK Communications (XO); Pac West Telecom; US Telepacific; WinStar; WorldCom</p> <p><b>CLECs: 18</b>  <b>Operational Networks: 29</b>  <b>Off-Net Networks: 2</b></p>	<p>Adelphia Business Solutions; Allegiance Telecom; AT&amp;T; Cogent Communications; Cox Communications; Eagle Communications; Focal; Global Crossing; Globalcom; <i>ICG Communications</i>; IntelliSpace; Intermedia; Mpower; Net2000; Network Plus; Pac-West Telecomm; PaeTec; RCN; Sphera Optical Networks; Telseon; <i>Time Warner Telecom, Inc.</i>; US Telepacific; Verado Holdings; WinStar; WorldCom; XO</p> <p><b>CLECs: 26</b>  <b>Operational Networks: 33</b>  <b>On-Net Networks: 12</b></p>
2. New York, NY	<p>Allegiance Telecom; AT&amp;T; BTI; Cablevision Lightpath; Community Networks; CTC Communications; DualStar Communications; e.spire; Eagle Communications; Electric Lightwave; Focal; Frontier Communications; Global NAPs; Hyperion Telecommunications; Intermedia; Level 3 Communications; d/b/a Met Tel; Marathon Communications; Metromedia Fiber Network; Net2000; <i>Net-Tel Corporation</i>; NEXTLINK Communications (XO); North American Telecommunications; NorthEast Optic Network Services; RCN; Reach Communications; <i>RNK</i>; Time Warner Telecom; WinStar; WorldCom</p> <p><b>CLECs: 30</b>  <b>Operational Networks: 41</b>  <b>Off-Net Networks: 2</b></p>	<p>Adelphia Business Solutions; Allegiance Telecom; <i>Arbros Communications</i>; AT&amp;T; Broadview Networks; BTI; Cablevision Lightpath; Cogent Communications; CTC Communications; e.spire; Eagle Communications; Fairpoint Communications; <i>Focal</i>; GiantLoop Network; GlobalCrossing; Globalcom; IntelliSpace; Intermedia; Lightyear Communications; NECLEC; Net2000; Network Plus; <i>PaeTec</i>; RCN; Reach Communications; Sphera Optical Networks; Telseon; Time Warner Telecom; WinStar; WorldCom; XO</p> <p><b>CLECs: 31</b>  <b>Operational Networks: 56</b>  <b>On-Net Networks: 8</b></p>
3. Chicago, IL	<p>21st Century; Allegiance Telecom; AT&amp;T; Dakota Services; Eagle Communications; Electric Lightwave; Focal; Frontier Communications; Global NAPs; Globalcom; InterAccess; Intermedia; Level 3 Communications; MGC Communications; <i>Net-Tel Corporation</i>; NEXTLINK Communications (XO); Ovation Communications; Sharon Telephone Company; WinStar; WorldCom</p> <p><b>CLECs: 20</b>  <b>Operational Networks: 23</b>  <b>Off-Net Networks: 1</b></p>	<p>Adelphia Business Solutions; Allegiance Telecom; <i>AT&amp;T</i>; Cogent Communications; CoreComm; Digital Pipeline Communications; <i>Eagle Communications</i>; Focal; GiantLoop Network; Global Crossing; Globalcom; IntelliSpace; Intermedia; <i>Lightyear Communications</i>; <i>McLeodUSA</i>; Mpower; Net2000; Network Plus; PaeTec; RCN; Sharon Telephone Company; TDS Metrocom; Telseon; <i>Time Warner Telecom</i>; WinStar; WorldCom; XO; Yipes</p> <p><b>CLECs: 28</b>  <b>Operational Networks: 47</b>  <b>On-Net Networks: 8</b></p>
4. Philadelphia, PA-NJ	<p>Allegiance Telecom; AT&amp;T; Conectiv Communications; e.spire; Eagle Communications; Focal; Hyperion Telecommunications; Intermedia; Level 3 Communications; Metromedia Fiber Network; <i>Net-Tel Corporation</i>; NEXTLINK Communications (XO); WinStar; WorldCom</p> <p><b>CLECs: 14</b>  <b>Operational Networks: 19</b>  <b>Off-Net Networks: 2</b></p>	<p>Adelphia Business Solutions; Allegiance Telecom; Arbros Communications; AT&amp;T; Broadview Networks; BTI Telecom; CEI Networks; Cogent Communications; <i>Comcast Business Communications</i>; <i>CoreComm</i>; e.spire; Eagle Communications; <i>Focal</i>; GiantLoop Network; Global Crossing; IntelliSpace; Intermedia; Net2000; RCN; Telseon; US LEC; WinStar; WorldCom; XO; Yipes</p> <p><b>CLECs: 25</b>  <b>Operational Networks: 40</b>  <b>On-Net Networks: 15</b></p>

\* The names of CLECs operating Off-Net networks in 1998, or On-Net networks in 2001, appear in italics.

<b>MSA</b>	<b>CLEC Networks – 1998</b>	<b>CLEC Networks – 2001</b>
5. Washington, DC-MD-VA-WV	AT&T; e.spire; Electric Lightwave; FairPoint Communications; Fiber Services, Inc.; Focal; Frontier Communications; Global NAPs; Hyperion Telecommunications; Intermedia; Jones Communications; Level 3 Communications; Metromedia Fiber Network; Net2 Communications; <i>Net-Tel Corporation</i> ; RCN; WinStar; WorldCom  <b>CLECs: 18</b> <b>Operational Networks: 31</b> <b>Off-Net Networks: 2</b>	Adelphia Business Solutions; Advanced TelCom Group; Allegiance Telecom; <i>Arbros Communications</i> ; AT&T; BTI Telecom; Cavalier Telephone; Cogent Communications; <i>Comcast Business Communications</i> ; e.spire; Fairpoint Communications; <i>Focal</i> ; Global Crossing; Global NAPs; Globalcom; IntelliSpace; Intermedia; Net2000; PaeTec; <i>RCN</i> ; Sigma Networks; US LEC; WinStar; WorldCom; XO.  <b>CLECs: 25</b> <b>Operational Networks: 59</b> <b>On-Net Networks: 13</b>
6. Detroit, MI	AT&T; Coast to Coast Telecommunications; Frontier Communications; Intermedia; Level 3 Communications; <i>Net-Tel Corporation</i> ; US MidTel; WinStar; WorldCom.  <b>CLECs: 9</b> <b>Operational Networks: 18</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; Allegiance Telecom; AT&T; Comcast Business Communications; Focal; Intermedia; Lightyear Communications; MichTel; Mpower; TDS Metrocom; TelNet Worldwide; Telseon; WorldCom; XO.  <b>CLECs: 14</b> <b>Operational Networks: 35</b>
7. Houston, TX	AT&T; CapRock Communications; Digital Teleport; e.spire; Eagle Communications; GST Telecommunications; ICG Communications; Intermedia; ITC DeltaCom; Level 3 Communications; Logix Communications; <i>Net-Tel Corporation</i> ; OpTel Telecom; Pointe Communications; Time Warner Telecom; WinStar; WorldCom  <b>CLECs: 17</b> <b>Operational Networks: 16</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; Allegiance Telecom; AT&T; <i>Birch Telecom</i> ; Cogent Communications; e.spire; <i>Eagle Communications</i> ; Focal; Global Crossing; ICG Communications; Intermedia; Ionex Telecommunications; ITC^DeltaCom; <i>Lightyear Communications</i> ; Logix Communications Enterprises; Madison River Communications; Mpower; Telseon; Time Warner Telecom; WorldCom; XO; Yipes  <b>CLECs: 22</b> <b>Operational Networks: 25</b> <b>On-Net Networks: 3</b>
8. Atlanta, GA	Allegiance Telecom; BTI; Convergent Communications; e.spire; Eagle Communications; Electric Lightwave; Frontier Communications; Global NAPs; ICG Communications; Intermedia; ITC DeltaCom; Level 3 Communications; Marietta Fibernet; MediaOne Telecommunications; MGC Communications; <i>Net-Tel Corporation</i> ; NEXTLINK Communications (XO); Pointe Communications; US LEC; WinStar; WorldCom  <b>CLECs: 21</b> <b>Operational Networks: 35</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; Allegiance Telecom; AT&T; <i>Birch Telecom</i> ; BTI Telecom; Cbeyond Communications; Cogent Communications; Cox Communications; e.spire; Eagle Communications; Focal; Global Crossing; Globalcom; ICG Communications; IntelliSpace; Intermedia; ITC^DeltaCom; LecStar; Lightyear Communications; Madison River Communications; Mpower; Network Plus; Network Telephone; <i>NewSouth Communications</i> ; NuVox Communications; Telseon; Time Warner Telecom; US LEC; WorldCom; XO; Yipes  <b>CLECs: 31</b> <b>Operational Networks: 45</b> <b>On-Net Networks: 6</b>

MSA	CLEC Networks – 1998	CLEC Networks – 2001
9. Dallas, TX	<p>Allegiance Telecom; AT&amp;T; BTI; CapRock Communications; Convergent Communications; e.spire; Eagle Communications; Electric Lightwave; Frontier Communications; GST Telecommunications; ICG Communications; Intermedia; ITC DeltaCom; Level 3 Communications; Logix Communications; <i>Net-Tel Corporation</i>; NEXTLINK Communications (XO); OpTel Telecom; Pointe Communications; Telephone Plus; WinStar; WorldCom</p> <p><b>CLECs: 22</b>  <b>Operational Networks: 23</b>  <b>Off-Net Networks: 2</b></p>	<p>Adelphia Business Solutions; Allegiance Telecom; AT&amp;T; <i>Birch Telecom</i>; BTI Telecom; Cbeyond Communications; Cogent Communications; e.spire; <i>Eagle Communications</i>; Fairpoint Communications; Focal; GiantLoop Network; Global Crossing; ICG Communications; IntelliSpace; Intermedia; Ionex Telecommunications; ITC^DeltaCom; Lightyear Communications; Logix Communications Enterprises; Madison River Communications; Mpower; Net2000; NTS Communications; Sphera Optical Networks; Tellaire Corporation; Telseon; Time Warner Telecom; WorldCom; XO; Yipes</p> <p><b>CLECs: 31</b>  <b>Operational Networks: 36</b>  <b>On-Net Networks: 2</b></p>
10. Boston, MA-NH	<p>Allegiance Telecom; AT&amp;T; CTC Communications; Eagle Communications; Focal; Frontier Communications; Global NAPs; HarardNet; Intermedia; Level 3 Communications; MediaOne Telecommunications; <i>Net-Tel Corporation</i>; NorthEast Optic Network Services; RCN; RNK; WinStar; WorldCom</p> <p><b>CLECs: 17</b>  <b>Operational Networks: 46</b>  <b>Off-Net Networks: 1</b></p>	<p>Adelphia Business Solutions; Allegiance Telecom; <i>Arbros Communications</i>; AT&amp;T; Broadview Networks; Cogent Communications; Conversent Communications; CTC Communications; <i>Eagle Communications</i>; Focal; GiantLoop Network; Global Crossing; IntelliSpace; Intermedia; <i>Lightship Telecom</i>; <i>Lightyear Communications</i>; NECLEC; Net2000; Network Plus; PaeTec; <i>RCN</i>; <i>RNK Telecom</i>; Sphera Optical Networks; WinStar; WorldCom; XO; Yipes</p> <p><b>CLECs: 27</b>  <b>Operational Networks: 54</b>  <b>On-Net Networks: 35</b></p>
11. Riverside-San Bernardino, CA	<p>GST Telecommunications; ICG Communications; MGC Communications; Pac West Telecom</p> <p><b>CLECs: 4</b>  <b>Operational Networks: 11</b></p>	<p><i>AT&amp;T</i>; <i>ICG Communications</i>; Mpower; Pac-West Telecomm; <i>Verado Holdings</i></p> <p><b>CLECs: 5</b>  <b>Operational Networks: 6</b>  <b>On-Net Networks: 4</b></p>
12. Phoenix-Mesa, AZ	<p>Advanced Radio Telecom; AT&amp;T; CapRock Communications; Cox Communications; Digital Teleport; Electric Lightwave; Frontier Communications; GST Telecommunications; ICG Communications; Intermedia; <i>Net-Tel Corporation</i>; NEXTLINK Communications (XO); Telephone Plus; WinStar; WorldCom</p> <p><b>CLECs: 15</b>  <b>Operational Networks: 14</b>  <b>Off-Net Networks: 1</b></p>	<p>Adelphia Business Solutions; Allegiance Telecom; AT&amp;T; Cox Communications; e.spire; Eschelon Telecom; Global Crossing; Intermedia; Lightyear Communications; McLeodUSA; Pac-West Telecomm; Telseon; WorldCom; XO</p> <p><b>CLECs: 14</b>  <b>Operational Networks: 16</b></p>
13. San Diego, CA	<p>AT&amp;T; Electric Lightwave; Frontier Communications; GST Telecommunications; ICG Communications; Level 3 Communications; MGC Communications; Net-Tel Corporation; PacWest Telecom; Time Warner Telecom; WinStar; WorldCom</p> <p><b>CLECs: 12</b>  <b>Operational Networks: 17</b></p>	<p>Allegiance Telecom; AT&amp;T; Cox Communications; Global Crossing; <i>ICG Communications</i>; IntelliSpace; Lightyear Communications; Mpower; Pac-West Telecomm; PaeTec; <i>RCN</i>; Telseon; Time Warner Telecom; US Telepacific; WorldCom; <i>Verado Holdings</i>; XO; Yipes</p> <p><b>CLECs: 18</b>  <b>Operational Networks: 17</b>  <b>On-Net Networks: 6</b></p>

<b>MSA</b>	<b>CLEC Networks – 1998</b>	<b>CLEC Networks – 2001</b>
14. Minneapolis-St. Paul	AT&T; Bresnan Communications; Frontier Communications; InfoTel Communications; Integra Telecom; KMC Telecom; MediaOne Telecommunications; <i>Net-Tel Corporation</i> ; Ovation Communications; WinStar; WorldCom <b>CLECs: 11</b> <b>Operational Networks: 12</b> <b>Off-Net Networks: 1</b>	Allegiance Telecom; AT&T; <i>Eschelon Telecom</i> ; Focal; Global Crossing; HickoryTech; Integra Telecom; Intermedia; KMC Telecom; <i>McLeod USA</i> ; <i>Time Warner Telecom</i> ; WorldCom; XO <b>CLECs: 13</b> <b>Operational Networks: 16</b> <b>On-Net Networks: 6</b>
15. Orange County, CA	AT&T; Cox Communications; FirstWorld Communications; Focal; Frontier Communications; GST Telecommunications; ICG Communications; MGC Communications; <i>Net-Tel Corporation</i> ; NEXTLINK Communications (XO); Pac West Telecomm; WinStar; WorldCom <b>CLECs: 13</b> <b>Operational Networks: 21</b> <b>Off-Net Networks: 1</b>	Allegiance Telecom; AT&T; Cox Communications; <i>Focal</i> ; Global Crossing; <i>ICG Communications</i> ; <i>Lightyear Communications</i> ; Mpower; Pac-West Telecomm; PaeTec; Time Warner Telecom; Verado Holdings; <i>US Telepacific</i> ; WorldCom; XO <b>CLECs: 15</b> <b>Operational Networks: 27</b> <b>On-Net Networks: 4</b>
16. Nassau-Suffolk, NY	Cablevision Lightpath; CTC Communications; Intermedia <b>CLECs: 3</b> <b>Operational Networks: 9</b>	AT&T; <i>Cablevision Lightpath</i> ; Conversent Communications; CTC Communications; IntelliSpace; Intermedia; WorldCom <b>CLECs: 7</b> <b>Operational Networks: 15</b> <b>On-Net Networks: 5</b>
17. St. Louis, MO-IL	AT&T; Birch Telecom; BroadSpan Communications; Digital Teleport; Frontier Communications; Intermedia; <i>Net-Tel Corporation</i> ; WinStar; WorldCom <b>CLECs: 9</b> <b>Operational Networks: 8</b> <b>Off-Net Networks: 1</b>	Allegiance Telecom; AT&T; Birch Telecom; Global Crossing; Intermedia; Lightyear Communications; Logix Communications Enterprises; <i>McLeodUSA</i> ; NuVox Communications; Telseon; WorldCom; XO <b>CLECs: 12</b> <b>Operational Networks: 23</b> <b>On-Net Networks: 1</b>
18. Baltimore, MD	AT&T; Conectiv; e.spire; Intermedia; Level 3 Communications; Net2 Communications; <i>Net-Tel Corporation</i> ; WinStar; WorldCom <b>CLECs: 9</b> <b>Operational Networks: 9</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; Advanced TelCom Group; Allegiance Telecom; <i>Arbras Communications</i> ; AT&T; Cavalier Telephone; Comcast Business Communications; e.spire; Focal; Global Crossing; IntelliSpace; Intermedia; <i>Lightyear Communications</i> ; Net2000; <i>PaeTec</i> ; RCN; US LEC; WorldCom; XO <b>CLECs: 19</b> <b>Operational Networks: 16</b> <b>On-Net Networks: 4</b>
19. Oakland, CA	Allegiance Telecom; AT&T; Focal; Frontier Communications; GST Telecommunications; ICG Communications; <i>Net-Tel Corporation</i> ; NEXTLINK Communications (XO); Pac West Telecomm; WinStar; WorldCom <b>CLECs: 11</b> <b>Operational Networks: 20</b> <b>Off-Net Networks: 1</b>	Allegiance Telecom; AT&T; <i>Focal</i> ; Global Crossing; <i>ICG Communications</i> ; Mpower; Pac-West Telecomm; <i>US Telepacific</i> ; WorldCom; XO <b>CLECs: 10</b> <b>Operational Networks: 10</b> <b>On-Net Networks: 3</b>

MSA	CLEC Networks – 1998	CLEC Networks – 2001
20. Seattle-Bellevue-Everett, WA	Advanced Radio Telecom; AT&T; Convergent Communications; Electric Lightwave; Frontier Communications; GST Telecommunications; Level 3 Communications; Marathon Communications; <i>Net-Tel Corporation</i> ; Telephone Plus; WinStar; WorldCom <b>CLECs: 12</b> <b>Operational Networks: 13</b>	Adelphia Business Solutions; Allegiance Telecom; <i>AT&amp;T</i> ; Cogent Communications; Eschelon Telecom; Focal; Global Crossing; Integra Telecom; Intermedia; Lightyear Communications; <i>McLeodUSA</i> ; Pac-West Telecomm; Telseon; Terabeam; WinStar; WorldCom; XO <b>CLECs: 17</b> <b>Operational Networks: 20</b> <b>On-Net Networks: 2</b>
21. Tampa-St. Petersburg-Clearwater, FL	AT&T; e.spire; Eagle Communications; Florida Digital Network; Frontier Communications; Hyperion Telecommunications; Intermedia; <i>Net-Tel Corporation</i> ; Time Warner Telecom; US LEC; WinStar; WorldCom <b>CLECs: 12</b> <b>Operational Networks: 12</b>	Adelphia Business Solutions; Allegiance Telecom; AT&T; BTI; e.spire; <i>Eagle Communications</i> ; <i>Florida Digital Network</i> ; Global Crossing; Intermedia; ITC DeltaCom; Mpower; Net2000; NewSouth Communications; Telseon; Time Warner Telecom; <i>US LEC</i> ; WinStar; WorldCom; XO <b>CLECs: 19</b> <b>Operational Networks: 23</b> <b>On-Net Networks: 5</b>
22. Pittsburgh, PA	AT&T; Hyperion Telecommunications; Intermedia; <i>Net-Tel Corporation</i> ; WorldCom <b>CLECs: 5</b> <b>Operational Networks: 4</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; <i>Arbros Communications</i> ; AT&T; Choice One Communications; Global Crossing; Intermedia; PennTelecom; <i>RCN</i> ; US LEC; WorldCom; Yipes <b>CLECs: 11</b> <b>Operational Networks: 21</b> <b>On-Net Networks: 2</b>
23. Cleveland-Lorain-Elyria, OH	AT&T; Cox Communications; e.spire; Frontier Communications; ICG Communications; Intermedia; <i>Net-Tel Corporation</i> ; NEXTLINK Communications (XO); WinStar; WorldCom <b>CLECs: 10</b> <b>Operational Networks: 9</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; Allegiance Telecom; AT&T; Cablevision Lightpath; CoreComm; Focal; Global Crossing; ICG Communications; Intermedia; Lightyear Communications; <i>McLeodUSA</i> ; Mpower; WorldCom; XO <b>CLECs: 14</b> <b>Operational Networks: 15</b>
24. Miami, FL	BTI; Eagle Communications; Florida Digital Network; Global NAPs; Hyperion Telecommunications; Intermedia; MediaOne Telecommunications; <i>Net-Tel Corporation</i> ; NEXTLINK Communications (XO); Pointe Communications; US LEC; WinStar; WorldCom <b>CLECs: 13</b> <b>Operational Networks: 13</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; Allegiance Telecom; AT&T; BTI Telecom; Cogent Communications; e.spire; <i>Eagle Communications</i> ; <i>Florida Digital Network</i> ; Intermedia; <i>Lightyear Communications</i> ; Mpower; Net2000; Network Plus; NewSouth Communications; NuVox Communications; PacTec; Sphera Optical Networks; Telseon; US LEC; WorldCom; XO; Yipes <b>CLECs: 22</b> <b>Operational Networks: 23</b> <b>On-Net Networks: 3</b>
25. Denver, CO	AT&T; Convergent Communications; Electric Lightwave; Frontier Communications; GST Telecommunications; ICG Communications; Intermedia; Level 3 Communications; <i>Net-Tel Corporation</i> ; NEXTLINK Communications (XO); Telephone Plus; WinStar; WorldCom <b>CLECs: 13</b> <b>Operational Networks: 12</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; Allegiance Telecom; AT&T; Eschelon Telecom; Global Crossing; ICG Communications; Intermedia; Lightyear Communications; <i>McLeodUSA</i> ; Net2000; Pac-West Telecomm; Telseon; Terabeam; <i>Time Warner Telecom</i> ; Vanion; WinStar; WorldCom; XO; Yipes <b>CLECs: 19</b> <b>Operational Networks: 24</b> <b>On-Net Networks: 1</b>

MSA	CLEC Networks – 1998	CLEC Networks – 2001
26. Newark, NJ	Focal; Hyperion Telecommunications; MH Lightnet; <i>Net-Tel Corporation</i> ; WinStar; WorldCom  <b>CLECs: 6</b> <b>Operational Networks: 6</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; Allegiance Telecom; <i>Arbros Communications</i> ; AT&T; Cablevision Lightpath; <i>Comcast Business Communications</i> ; Focal; IntelliSpace; <i>Lightyear Communications</i> ; Net2000; RCN; WorldCom; XO  <b>CLECs: 13</b> <b>Operational Networks: 16</b> <b>On-Net Networks: 5</b>
27. Portland-Vancouver, OR-WA	Advanced Radio Telecom; AT&T; Beaver Creek Cooperative Telephone; Convergent Communications; Electric Lightwave; FirstWorld Communications; Frontier Communications; GST Telecommunications; Integra Telecom; <i>Net-Tel Corporation</i> ; NEXTLINK Communications (XO); Telephone Plus; WinStar; WorldCom  <b>CLECs: 14</b> <b>Operational Networks: 17</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; Advanced TelCom Group; Allegiance Telecom; AT&T; Eschelon Telecom; Global Crossing; Integra Telecom; Intermedia; McLeodUSA; RIO Communications; WorldCom; XO.  <b>CLECs: 12</b> <b>Operational Networks: 15</b>
28. San Francisco, CA	Allegiance Telecom; AT&T; Convergent Communications; Electric Lightwave; Focal; GST Telecommunications; ICG Communications; Intermedia; Level 3 Communications; <i>Net-Tel Corporation</i> ; NEXTLINK Communications (XO); Pac West Telecomm; Telephone Plus; WinStar; WorldCom  <b>CLECs: 15</b> <b>Operational Networks: 17</b>	Adelphia Business Solutions; Allegiance Telecom; AT&T; Cogent Communications; Focal; GiantLoop Network; Global Crossing; Globalcom; ICG Communications; IntelliSpace; Intermedia; <i>Lightyear Communications</i> ; Mpower; Net2000; Pac-West Telecomm; RCN; Telseon; <i>US Telepacific</i> ; WorldCom; XO  <b>CLECs: 20</b> <b>Operational Networks: 21</b> <b>On-Net Networks: 9</b>
29. Kansas City, MO-KS	Advanced Communications Group; AT&T; Birch Telecom; Digital Teleport; e.spire; ExOp of Missouri; Frontier Communications; Intermedia; Logix Communications; <i>Net-Tel Corporation</i> ; WinStar; WorldCom  <b>CLECs: 12</b> <b>Operational Networks: 17</b> <b>Off-Net Networks: 2</b>	AT&T; Birch Telecom; e.spire; Global Crossing; <i>Ionex Telecommunications</i> ; Intermedia; Lightyear Communications; Logix Communications; McLeodUSA; NuVox Communications; WorldCom  <b>CLECs: 11</b> <b>Operational Networks: 11</b> <b>On-Net Networks: 2</b>
30. San Jose, CA	AT&T; Focal; Frontier Communications; ICG Communications; Level 3 Communications; <i>Net-Tel Corporation</i> ; NEXTLINK Communications (XO); Pac West Telecomm; WorldCom  <b>CLECs: 9</b> <b>Operational Networks: 21</b> <b>Off-Net Networks: 2</b>	Allegiance Telecom; AT&T; Cogent Communications; e.spire; Focal; Global Crossing; <i>ICG Communications</i> ; Net2000; Pac-West Telecomm; US Telepacific; <i>WorldCom</i> ; XO; Yipes  <b>CLECs: 13</b> <b>Operational Networks: 19</b> <b>On-Net Networks: 4</b>
31. Cincinnati, OH-KY-IN	AT&T; ICG Communications; Intermedia; <i>Net-Tel Corporation</i> ; Time Warner Telecom; WorldCom  <b>CLECs: 6</b> <b>Operational Networks: 5</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; AT&T; Broadslate Networks; Global Crossing; ICG Communications; Intermedia; Lightyear Communications; NuVox Communications; Telseon; Time Warner Telecom; WorldCom  <b>CLECs: 11</b> <b>Operational Networks: 13</b>

MSA	CLEC Networks – 1998	CLEC Networks – 2001
32. Fort Worth-Arlington, TX	<p>Allegiance Telecom; AT&amp;T; CapRock Communications; e.spire; Frontier Communications; Logix Communications; <i>Net-Tel Corporation</i>; WorldCom</p> <p><b>CLECs: 8</b>  <b>Operational Networks: 8</b>  <b>Off-Net Networks: 1</b></p>	<p>Allegiance Telecom; AT&amp;T; <i>Birch Telecom</i>; e.spire; Focal; Global Crossing; Intermedia; Logix Communications; Mpower</p> <p><b>CLECs: 9</b>  <b>Operational Networks: 10</b>  <b>On-Net Networks: 2</b></p>
33. Orlando, FL	<p>AT&amp;T; BTI; Florida Digital Network; Hyperion Telecommunications; Intermedia; ITC DeltaCom; <i>Net-Tel Corporation</i>; Orlando Telephone Company; Time Warner Telecom; US LEC; WorldCom</p> <p><b>CLECs: 11</b>  <b>Operational Networks: 11</b>  <b>Off-Net Networks: 2</b></p>	<p>Adelphia Business Solutions; AT&amp;T; BTI; e.spire; <i>Florida Digital Network</i>; Global Crossing; Intermedia; ITC^DeltaCom; Net2000; Network Plus; Network Telephone; NewSouth Communications; Orlando Telephone Company; Telseon; Time Warner Telecom; US LEC; WorldCom</p> <p><b>CLECs: 17</b>  <b>Operational Networks: 23</b>  <b>On-Net Networks: 4</b></p>
34. Sacramento, CA	<p>AT&amp;T; Electric Lightwave; Frontier Communications; GST Telecommunications; ICG Communications; Net-Tel Corporation; Pac West Telecomm; Telephone Plus; WinStar; WorldCom</p> <p><b>CLECs: 10</b>  <b>Operational Networks: 10</b></p>	<p>Allegiance Telecom; AT&amp;T; Global Crossing; ICG Communications; Mpower; Pac-West Telecomm; Western Integrated Networks; WorldCom; XO</p> <p><b>CLECs: 9</b>  <b>Operational Networks: 11</b></p>
35. San Antonio, TX	<p>e.spire; ICG Communications; Intermedia; ITC DeltaCom; Logix Communications; Net-Tel; Telephone Plus; Time Warner Telecom; Waller Creek Communications; WorldCom</p> <p><b>CLECs: 10</b>  <b>Operational Networks: 10</b></p>	<p>Adelphia Business Solutions; Allegiance Telecom; AT&amp;T; <i>Birch Telecom</i>; e.spire; Global Crossing; Grande Communications; ICG Communications; ITC^DeltaCom; Logix Communications; Mpower; Time Warner Telecom; WorldCom; XO</p> <p><b>CLECs: 14</b>  <b>Operational Networks: 15</b>  <b>On-Net Networks: 1</b></p>
36. Las Vegas, NV-AZ	<p>Digital Teleport; e.spire; Electric Lightwave; GST Telecommunications; MGC Communications; <i>Net-Tel Corporation</i>; NEXTLINK Communications (XO); Telephone Plus; WinStar</p> <p><b>CLECs: 9</b>  <b>Operational Networks: 9</b>  <b>Off-Net Networks: 1</b></p>	<p>Cox Communications; e.spire; <i>Eagle Communications</i>; Intermedia; Mpower; Pac-West Telecomm; US Telepacific; XO</p> <p><b>CLECs: 8</b>  <b>Operational Networks: 8</b>  <b>On-Net Networks: 1</b></p>
37. Fort Lauderdale, FL	<p>AT&amp;T; e.spire; Eagle Communications; Florida Digital Network; Intermedia; MediaOne Telecommunications; MGC Communications; <i>Net-Tel Corporation</i>; Supra Telecommunications &amp; Information Systems; WorldCom</p> <p><b>CLECs: 10</b>  <b>Operational Networks: 10</b>  <b>Off-Net Networks: 1</b></p>	<p>Adelphia Business Solutions; Allegiance Telecom; AT&amp;T; BTI; e.spire; <i>Eagle Communications</i>; Florida Digital Network; Intermedia; ITC^DeltaCom; Mpower; Network Plus; NuVox Communications; <i>PaeTec</i>; US LEC; WorldCom; Yipes</p> <p><b>CLECs: 16</b>  <b>Operational Networks: 19</b>  <b>On-Net Networks: 3</b></p>
38. Indianapolis, IN	<p>AT&amp;T; Frontier Communications; Intermedia; <i>Net-Tel Corporation</i>; Time Warner Telecom; WorldCom</p> <p><b>CLECs: 6</b>  <b>Operational Networks: 5</b>  <b>Off-Net Networks: 1</b></p>	<p>Adelphia Business Solutions; AT&amp;T; Choice One Communications; Global Crossing; Intermedia; Lightyear Communications; McLeodUSA; NuVox Communications; Time Warner Telecom; WinStar; WorldCom</p> <p><b>CLECs: 11</b>  <b>Operational Networks: 15</b></p>



<b>MSA</b>	<b>CLEC Networks – 1998</b>	<b>CLEC Networks – 2001</b>
39. Norfolk-Virginia Beach-Newport News, VA-NC MSA	Cox Communications; Hyperion Telecommunications; KMC Telecom; Net2 Communications; US LEC  <b>CLECs: 5</b> <b>Operational Networks: 5</b>	Adelphia Business Solutions; ALLTEL; <i>Arbros Communications</i> ; AT&T; Cavalier Telephone; Cox Communications; KMC Telecom; Net2000; <i>US LEC</i> <b>CLECs: 9</b> <b>Operational Networks: 17</b> <b>On-Net Networks: 2</b>
40. Milwaukee-Waukesha, WI	AT&T; Dakota Services; Globalcom; <i>Net-Tel Corporation</i> ; Ovation Communications; Time Warner Telecom; US Xchange; WinStar; WorldCom <b>CLECs: 9</b> <b>Operational Networks: 10</b> <b>Off-Net Networks: 1</b>	AT&T; Choice One Communications; Global Crossing; Globalcom; <i>McLeodUSA</i> ; TDS Metrocom; Time Warner Telecom; WinStar; WorldCom <b>CLECs: 9</b> <b>Operational Networks: 12</b> <b>On-Net Networks: 1</b>
41. Columbus, OH	ICG Communications; Intermedia; <i>Net-Tel Corporation</i> ; NEXTLINK Communications (XO); Time Warner Telecom; WinStar  <b>CLECs: 6</b> <b>Operational Networks: 5</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; AT&T; Choice One Communications; CoreComm; Global Crossing; ICG Communications; Intermedia; <i>McLeodUSA</i> ; Mpower; NuVox Communications; Time Warner Telecom; XO <b>CLECs: 12</b> <b>Operational Networks: 12</b>
42. Charlotte-Gastonia- Rock Hill, NC-SC	AT&T; BTI; Eagle Communications; FairPoint Communications; ICG Communications; Intermedia; Time Warner Telecom; US LEC  <b>CLECs: 8</b> <b>Operational Networks: 8</b>	Adelphia Business Solutions; AT&T; <i>Birch Telecom</i> ; BTI; CTC Communications; <i>Eagle Communications</i> ; Global Crossing; ICG Communications; Intermedia; ITC^DeltaCom; Network Telephone; NewSouth Communications; NuVox Communications; Time Warner Telecom; US LEC <b>CLECs: 15</b> <b>Operational Networks: 16</b> <b>On-Net Networks: 2</b>
43. Bergen-Passaic, NJ	AT&T; Intermedia  <b>CLECs: 2</b> <b>Operational Networks: 2</b>	Allegiance Telecom; Conversent Communications; Focal; IntelliSpace <b>CLECs: 4</b> <b>Operational Networks: 5</b>
44. New Orleans, LA	American MetroComm; Columbia Telecommunications; Cox Communications; e.spire; Hyperion Telecommunications; Intermedia; ITC DeltaCom; NewSouth Communications; WinStar <b>CLECs: 9</b> <b>Operational Networks: 9</b>	Adelphia Business Solutions; Cox Communications; e.spire; Global Crossing; Intermedia; ITC^DeltaCom; Madison River Communications; Network Telephone; NewSouth Communications; US LEC; Xspedius <b>CLECs: 11</b> <b>Operational Networks: 12</b>
45. Salt Lake City-Ogden, UT	AT&T; Convergent Communications; Electric Lightwave; GST Telecommunications; <i>Net-Tel Corporation</i> ; NEXTLINK Communications (XO); Telephone Plus; WinStar; WorldCom <b>CLECs: 9</b> <b>Operational Networks: 11</b> <b>Off-Net Networks: 1</b>	AT&T; Eschelon Telecom; Global Crossing; Integra Telecom; Intermedia; <i>McLeodUSA</i> ; Pac- West Telecomm; WorldCom; XO <b>CLECs: 9</b> <b>Operational Networks: 9</b>

MSA	CLEC Networks – 1998	CLEC Networks – 2001
46. Greensboro-Winston Salem-High Point, NC	BTI; Eagle Communications; Intermedia; ITC DeltaCom; KMC Telecom; Time Warner Telecom; US LEC  <b>CLECs: 7</b> <b>Operational Networks: 11</b> <b>Off-Net Networks: 1</b>	ALLTEL; AT&T; BTI; <i>Birch Telecom</i> ; CTC Communications; <i>Eagle Communications</i> ; Intermedia; ITC^DeltaCom; KMC Telecom; Madison River Communications; Network Telephone; NewSouth Communications; NuVox Communications; <i>Time Warner Telecom</i> ; US LEC; Xspedius  <b>CLECs: 16</b> <b>Operational Networks: 28</b> <b>On-Net Networks: 3</b>
47. Nashville, TN	AT&T; Eagle Communications; Hyperion Telecommunications; ICG Communications; Intermedia; NewSouth Communications; NEXTLINK Communications (XO); US LEC  <b>CLECs: 8</b> <b>Operational Networks: 8</b>	Adelphia Business Solutions; AT&T; <i>Birch Telecom</i> ; BTI; <i>Eagle Communications</i> ; ICG Communications; Intermedia; ITC^DeltaCom; Network Telephone; NewSouth Communications; NuVox Communications; US LEC; XO; Xspedius  <b>CLECs: 14</b> <b>Operational Networks: 18</b> <b>On-Net Networks: 2</b>
48. Austin-San Marcos, TX	e.spire; ICG Communications; Intermedia; ITC DeltaCom; Level 3 Communications; Logix Communications; <i>Net-Tel Corporation</i> ; NEXTLINK Communications (XO); Telephone Plus; Time Warner Telecom; Waller Creek Communications; WorldCom  <b>CLECs: 12</b> <b>Operational Networks: 11</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; Allegiance Telecom; AT&T; <i>Birch Telecom</i> ; e.spire; Global Crossing; Grande Communications; ICG Communications; Intermedia; <i>ITC^DeltaCom</i> ; Logix Communications; Mpower; Time Warner Telecom; WorldCom; XO  <b>CLECs: 15</b> <b>Operational Networks: 15</b> <b>On-Net Networks: 2</b>
49. Buffalo-Niagara Falls, NY	AT&T; Choice One Communications; Hyperion Telecommunications; Intermedia; <i>Net-Tel Corporation</i> ; WorldCom  <b>CLECs: 6</b> <b>Operational Networks: 5</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; AT&T; Broadview Networks; Choice One Communications; <i>Eagle Communications</i> ; Intermedia; WorldCom  <b>CLECs: 7</b> <b>Operational Networks: 7</b> <b>On-Net Networks: 1</b>
50. Middlesex-Somerset-Hunterdon, NJ	AT&T; Hyperion Telecommunications; Intermedia; <i>Net-Tel Corporation</i> ; WorldCom  <b>CLECs: 5</b> <b>Operational Networks: 4</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; AT&T; <i>Focal</i> ; IntelliSpace; WorldCom  <b>CLECs: 5</b> <b>Operational Networks: 8</b> <b>On-Net Networks: 1</b>
51. Hartford, CT	AT&T; Cox Communications; ICG Communications; Intermedia; <i>Net-Tel Corporation</i> ; NorthEast Optic Network Services; WorldCom  <b>CLECs: 7</b> <b>Operational Networks: 6</b> <b>Off-Net Networks: 1</b>	AT&T; Choice One Communications; Conversent Communications; Cox Communications; Global Crossing; Intermedia; Network Plus; PaeTec; WorldCom  <b>CLECs: 9</b> <b>Operational Networks: 9</b>
52. Monmouth-Ocean, NJ		AT&T <b>CLECs: 1</b> <b>Operational Networks: 1</b>

MSA	CLEC Networks – 1998	CLEC Networks – 2001
53. Raleigh, Durham, Chapel Hill, NC	BTI; Eagle Communications; Intermedia; <i>Net-Tel Corporation</i> ; Time Warner Telecom; US LEC; WorldCom  <b>CLECs: 7</b> <b>Operational Networks: 10</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; ALLTEL; AT&T; BTI; CTC Communications; <i>Eagle Communications</i> ; Intermedia; ITC^DeltaCom; Madison River Communications; Network Telephone; NewSouth Communications; NuVox Communications; Time Warner; US LEC; WorldCom <b>CLECs: 15</b> <b>Operational Networks: 29</b> <b>On-Net Networks: 2</b>
54. Memphis, TN-AR-MS	Eagle Communications; Hyperion Telecommunications; Intermedia; NEXTLINK Communications (XO); Time Warner Telecom; US LEC; WorldCom  <b>CLECs: 7</b> <b>Operational Networks: 7</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; AT&T; <i>Birch Telecom</i> ; <i>Eagle Communications</i> ; ICG Communications; Intermedia; ITC^DeltaCom; Mpower; Network Telephone; NewSouth Communications; NuVox Communications; Time Warner Telecom; US LEC; WorldCom; XO; Xspedius <b>CLECs: 16</b> <b>Operational Networks: 16</b> <b>On-Net Networks: 2</b>
55. Providence-Fall River-Warwick, RI-MA	AT&T; CTC Communications; Intermedia; <i>Net-Tel Corporation</i> ; NorthEast Optic Network Services; RNK  <b>CLECs: 6</b> <b>Operational Networks: 4</b> <b>Off-Net Networks: 2</b>	AT&T; Choice One Communications; Conversent Communications; Cox Communications; CTC Communications; Intermedia; Log On America; Net2000; <i>PaeTec</i> ; WorldCom <b>CLECs: 10</b> <b>Operational Networks: 10</b> <b>On-Net Networks: 1</b>
56. Jacksonville, FL	e.spire; Florida Digital Network; Frontier Communications; Hyperion Telecommunications; Intermedia; ITC DeltaCom; MediaOne Telecommunications; <i>Net-Tel Corporation</i> ; US LEC  <b>CLECs: 9</b> <b>Operational Networks: 8</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; ALLTEL; AT&T; BTI; e.spire; <i>Florida Digital Network</i> ; Intermedia; ITC^DeltaCom; <i>Lightyear Communications</i> ; NewSouth Communications; NuVox Communications; US LEC <b>CLECs: 12</b> <b>Operational Networks: 15</b> <b>On-Net Networks: 3</b>
57. Rochester, NY	AT&T; Eagle Communications; Frontier Communications; Intermedia; Net-Tel ; Time Warner Telecom; WorldCom  <b>CLECs: 7</b> <b>Operational Networks: 7</b>	AT&T; Choice One Communications; <i>Eagle Communications</i> ; Global Crossing; Intermedia; Northland Communications; <i>PaeTec</i> ; Time Warner Telecom <b>CLECs: 8</b> <b>Operational Networks: 8</b> <b>On-Net Networks: 1</b>
58. Grand Rapids-Muskegon-Holland, MI	<i>Net-Tel Corporation</i> ; WorldCom  <b>CLECs: 2</b> <b>Operational Networks: 1</b> <b>Off-Net Networks: 1</b>	Choice One Communications; MichTel; TDS Metrocom; WorldCom <b>CLECs: 4</b> <b>Operational Networks: 8</b>
59. West Palm Beach, FL	AT&T; Intermedia; Net-Tel; Supra Telecommunications & Information Systems  <b>CLECs: 4</b> <b>Operational Networks: 4</b>	<i>Florida Digital Network</i> ; Intermedia; ITC^DeltaCom; Mpower; Network Telephone; <i>PaeTec</i> ; US LEC <b>CLECs: 7</b> <b>Operational Networks: 11</b> <b>On-Net Networks: 3</b>

MSA	CLEC Networks – 1998	CLEC Networks – 2001
60. Oklahoma City, OK	Cox Communications; Intermedia; Logix Communications; <i>Net-Tel Corporation</i> ; <i>WinStar</i> ; WorldCom <b>CLECs: 6</b> <b>Operational Networks: 4</b> <b>Off-Net Networks: 2</b>	AT&T; <i>Birch Telecom</i> ; Cox Communications; Logix Communications; NuVox Communications; WorldCom <b>CLECs: 6</b> <b>Operational Networks: 6</b> <b>On-Net Networks: 1</b>
61. Louisville, KY	e.spire; Hyperion Telecommunications; ICG Communications; Intermedia <b>CLECs: 4</b> <b>Operational Networks: 4</b>	Adelphia Business Solutions; AT&T; e.spire; ICG Communications; Intermedia; <i>Lightyear Communications</i> ; NewSouth Communications; NuVox Communications; US LEC <b>CLECs: 9</b> <b>Operational Networks: 9</b> <b>On-Net Networks: 1</b>
62. Richmond-Petersburg, VA	Hyperion Telecommunications; Intermedia; MediaOne Telecommunications; Net2 Communications; Net-Tel; WorldCom <b>CLECs: 6</b> <b>Operational Networks: 6</b>	Adelphia Business Solutions; ALLTEL; <i>Arbros Communications</i> ; AT&T; Broadslate Networks; BTI; Cavalier Telephone; Intermedia; Net2000; NTELOS; US LEC <b>CLECs: 11</b> <b>Operational Networks: 11</b> <b>On-Net Networks: 2</b>
63. Dayton-Springfield, OH	ICG Communications; Intermedia. <b>CLECs: 2</b> <b>Operational Networks: 2</b>	AT&T; Broadslate Networks; Choice One Communications; ICG Communications; Intermedia; KMC Telecom; McLeodUSA; NuVox Communications; <i>Time Warner Telecom</i> <b>CLECs: 9</b> <b>Operational Networks: 8</b> <b>On-Net Networks: 2</b>
64. Greenville-Spartanburg-Anderson, SC	e.spire; Intermedia; ITC DeltaCom; NewSouth Communications <b>CLECs: 4</b> <b>Operational Networks: 5</b>	ALLTEL; <i>Birch Telecom</i> ; BTI; e.spire; Intermedia; ITC^DeltaCom; KMC Telecom; Network Telephone; NewSouth Communications; NuVox Communications <b>CLECs: 10</b> <b>Operational Networks: 13</b> <b>On-Net Networks: 1</b>
65. Fresno, CA	GST Telecommunications; <i>Net-Tel Corporation</i> ; Pac West Telecom; WorldCom <b>CLECs: 4</b> <b>Operational Networks: 4</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; ICG Communications; Pac-West Telecomm; WorldCom <b>CLECs: 4</b> <b>Operational Networks: 4</b>
66. Birmingham, AL	AT&T; e.spire; ICG Communications; Intermedia; ITC DeltaCom; <i>WinStar</i> <b>CLECs: 6</b> <b>Operational Networks: 5</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; AT&T; <i>Birch Telecom</i> ; e.spire; ICG Communications; Intermedia; ITC^DeltaCom; Network Telephone; NewSouth Communications; US LEC; Xspedius <b>CLECs: 11</b> <b>Operational Networks: 13</b> <b>On-Net Networks: 1</b>
67. Albany-Schenectady-Troy, NY	AT&T; Choice One Communications; CTC Communications; Hyperion Telecommunications; Intermedia; <i>Net-Tel Corporation</i> ; Time Warner Telecom; WorldCom <b>CLECs: 8</b> <b>Operational Networks: 8</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; AT&T; Broadview Networks; <i>Cablevision Lightpath</i> ; Choice One Communications; CTC Communications; Fairpoint Communications; Intermedia; PaeTec; Time Warner Telecom <b>CLECs: 10</b> <b>Operational Networks: 10</b> <b>On-Net Networks: 1</b>

MSA	CLEC Networks – 1998	CLEC Networks – 2001
68. Honolulu, HI	GST Telecommunications; Time Warner Telecom; WinStar <b>CLECs: 3</b> <b>Operational Networks: 3</b>	Time Warner Telecom <b>CLECs: 1</b> <b>Operational Networks: 1</b>
69. Tucson, AZ	Cox Communications; e.spire; GST Telecommunications; Net-Tel Corporation; Telephone Plus; <i>WinStar</i> ; WorldCom <b>CLECs: 7</b> <b>Operational Networks: 6</b> <b>Off-Net Networks: 1</b>	Cox Communications; e.spire; <i>McLeodUSA</i> ; WorldCom <b>CLECs: 4</b> <b>Operational Networks: 3</b> <b>On-Net Networks: 1</b>
70. Tulsa, OK	e.spire; ICG Communications; Intermedia; Logix Communications; Net-Tel; <i>WinStar</i> ; WorldCom <b>CLECs: 7</b> <b>Operational Networks: 6</b> <b>Off-Net Networks: 1</b>	<i>Birch Telecom</i> ; e.spire; Intermedia; Logix Communications; NuVox Communications; WorldCom <b>CLECs: 6</b> <b>Operational Networks: 6</b> <b>On-Net Networks: 1</b>
71. Ventura, CA		<i>ICG Communications</i> <b>On-Net Networks: 1</b>
72. Syracuse, NY	AT&T; Eagle Communications; Hyperion Telecommunications; Intermedia; Net-Tel Corporation <b>CLECs: 5</b> <b>Operational Networks: 5</b>	Adelphia Business Solutions; AT&T; Broadview Networks; Choice One Communications; CTSI; Eagle Communications; Global Crossing; Intermedia; Northland Communications <b>CLECs: 9</b> <b>Operational Networks: 10</b>
73. Tacoma, WA	AT&T; Electric Lightwave <b>CLECs: 2</b> <b>Operational Networks: 2</b>	Advanced TelCom Group; <i>Eschelon Telecom</i> <b>CLECs: 2</b> <b>Operational Networks: 2</b> <b>On-Net Networks: 1</b>
74. El Paso, TX	Digital Teleport; e.spire; Frontier Communications; Intermedia; <i>Net-Tel Corporation</i> <b>CLECs: 5</b> <b>Operational Networks: 4</b> <b>Off-Net Networks: 1</b>	<i>Birch Telecom</i> ; e.spire; <i>Ionex Telecommunications</i> ; Logix Communications <b>CLECs: 4</b> <b>Operational Networks: 3</b> <b>On-Net Networks: 2</b>
75. Omaha, NE	AT&T; Convergent Communications; Cox Communications; <i>McLeodUSA</i> <b>CLECs: 4</b> <b>Operational Networks: 4</b>	ALLTEL; AT&T; Cox Communications; <i>McLeodUSA</i> <b>CLECs: 4</b> <b>Operational Networks: 5</b> <b>On-Net Networks: 1</b>
76. Akron, OH	ICG Communications <b>CLECs: 1</b> <b>Operational Networks: 1</b>	Choice One Communications; Global Crossing; ICG Communications; KMC Telecom; NuVox Communications; XO <b>CLECs: 6</b> <b>Operational Networks: 6</b>
77. Albuquerque, NM	e.spire; GST Telecommunications; <i>Net-Tel Corporation</i> ; WorldCom <b>CLECs: 4</b> <b>Operational Networks: 3</b> <b>Off-Net Networks: 1</b>	e.spire; <i>McLeodUSA</i> ; <i>NTS Communications</i> ; Pac-West Telecomm; WorldCom <b>CLECs: 5</b> <b>Operational Networks: 4</b> <b>On-Net Networks: 1</b>

MSA	CLEC Networks – 1998	CLEC Networks – 2001
78. Knoxville, TN	AT&T; Eagle Communications; Hyperion Telecommunications; Intermedia; <i>Net-Tel Corporation</i> ; US LEC; WorldCom  <b>CLECs: 7</b> <b>Operational Networks: 6</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; AT&T; <i>Birch Telecom</i> ; BTI Telecom; <i>Eagle Communications</i> ; Intermedia; <i>NewSouth Communications</i> ; NuVox Communications; US LEC; WorldCom  <b>CLECs: 10</b> <b>Operational Networks: 9</b> <b>On-Net Networks: 3</b>
79. Bakersfield, CA	GST Telecommunications; <i>Net-Tel Corporation</i> ; Pac West Telecomm; WorldCom  <b>CLECs: 4</b> <b>Operational Networks: 3</b> <b>Off-Net Networks: 1</b>	AT&T; Pac-West Telecomm; <i>Verado Holdings</i> ; WorldCom  <b>CLECs: 4</b> <b>Operational Networks: 3</b> <b>On-Net Networks: 1</b>
80. Gary, IN	AT&T <b>CLECs: 1</b> <b>Networks: 1</b>	
81. Allentown-Bethlehem-Easton, PA	Hyperion Telecommunications; NEXTLINK Communications (XO); RCN  <b>CLECs: 3</b> <b>Operational Networks: 6</b>	Adelphia Business Solutions; Broadslate Networks; Choice One Communications; RCN; XO  <b>CLECs: 5</b> <b>Operational Networks: 8</b>
82. Harrisburg-Lebanon-Carlisle, PA	Conectiv Communications; CTSI; Hyperion Telecommunications; Intermedia; NEXTLINK Communications (XO)  <b>CLECs: 5</b> <b>Operational Networks: 5</b>	Adelphia Business Solutions; <i>Arbros Communications</i> ; Broadslate Networks; Choice One Communications; CTSI; Intermedia; XO  <b>CLECs: 7</b> <b>Operational Networks: 7</b> <b>On-Net Networks: 1</b>
83. Scranton-Wilkes-Barre-Hazleton, PA	CTSI; Hyperion Telecommunications; NEXTLINK Communications (XO)  <b>CLECs: 3</b> <b>Operational Networks: 7</b>	Adelphia Business Solutions; Choice One Communications; CTSI; Fairpoint Communications; XO  <b>CLECs: 5</b> <b>Operational Networks: 11</b>
84. Toledo, OH	Buckeye TeleSystem; Intermedia; Net-Tel; WorldCom  <b>CLECs: 4</b> <b>Operational Networks: 4</b>	ALLTEL; Buckeye TeleSystem; ICG Communications; Intermedia; KMC Telecom; WorldCom  <b>CLECs: 6</b> <b>Operational Networks: 7</b>
85. Youngstown-Warren, OH	Net-Tel <b>CLECs: 1</b> <b>Operational Networks: 1</b>	<i>McLeodUSA</i> <b>CLECs: 1</b> <b>On-Net Networks: 1</b>
86. Baton Rouge, LA	American MetroCom; e.spire; Hyperion Telecommunications; Intermedia; ITC DeltaCom; KMC Telecom; <i>Net-Tel Corporation</i> ; State Communications; US Unwired  <b>CLECs: 9</b> <b>Operational Networks: 8</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; e.spire; <i>ITC^DeltaCom</i> ; Intermedia; KMC Telecom; Network Telephone; <i>NewSouth Communications</i> ; Xspedius  <b>CLECs: 8</b> <b>Operational Networks: 6</b> <b>On-Net Networks: 2</b>
87. Sarasota-Bradenton, FL	KMC Telecom  <b>CLECs: 1</b> <b>Operational Networks: 1</b>	Intermedia; <i>ITC^DeltaCom</i> ; KMC Telecom; NewSouth Communications  <b>CLECs: 4</b> <b>Operational Networks: 5</b> <b>On-Net Networks: 1</b>

<b>MSA</b>	<b>CLEC Networks – 1998</b>	<b>CLEC Networks – 2001</b>
88. Wilmington-Newark, DE-MD	AT&T; Conectiv Communications; Focal; Hyperion Telecommunications; Net-Tel; WorldCom <b>CLECs: 6</b> <b>Operational Networks: 7</b>	Adelphia Business Solutions; PacTec <b>CLECs: 2</b> <b>Operational Networks: 2</b>
89. Springfield, MA	AT&T; CTC Communications; Eagle Communications; Net-Tel; NorthEast Optic Network Services; WorldCom <b>CLECs: 6</b> <b>Operational Networks: 7</b>	Adelphia Business Solutions; AT&T; Choice One Communications; CTC Communications; <i>Eagle Communications</i> ; Fairpoint Communications; NECLEC; WorldCom <b>CLECs: 8</b> <b>Operational Networks: 9</b> <b>On-Net Networks: 1</b>
90. Ann Arbor, MI	KMC Telecom; US MidTel <b>CLECs: 2</b> <b>Operational Networks: 2</b>	Choice One Communications; KMC Telecom; MichTel; Mpower; TDS Metrocom <b>CLECs: 5</b> <b>Operational Networks: 9</b>
91. Little Rock-North Little Rock, AR	e.spire; Hyperion Telecommunications; Intermedia; <i>Net-Tel Corporation</i> ; WorldCom <b>CLECs: 5</b> <b>Operational Networks: 4</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; ALLTEL; e.spire; Intermedia; ITC^DeltaCom; Logix Communications; NuVox Communications; WorldCom <b>CLECs: 8</b> <b>Operational Networks: 13</b>
92. Stockton-Lodi, CA	Net-Tel; Pac West Telecom; WorldCom <b>CLECs: 3</b> <b>Operational Networks: 3</b>	Pac-West Telecomm; WorldCom <b>CLECs: 2</b> <b>Operational Networks: 2</b>
93. Charleston-North Charleston, SC	e.spire; Intermedia; Knology Holdings <b>CLECs: 3</b> <b>Operational Networks: 3</b>	ALLTEL; <i>Birch Telecom</i> ; BTI; e.spire; Intermedia; ITC^DeltaCom; KMC Telecom; <i>Knology Broadband</i> ; Network Telephone; <i>NewSouth Communications</i> ; US LEC <b>CLECs: 11</b> <b>Operational Networks: 14</b> <b>On-Net Networks: 6</b>
94. Jersey City, NJ	AT&T; Intermedia; <i>Net-Tel Corporation</i> ; WorldCom <b>CLECs: 4</b> <b>Operational Networks: 3</b> <b>Off-Net Networks: 1</b>	AT&T; Focal; IntelliSpace; Intermedia; RCN; <i>Time Warner Telecom</i> <b>CLECs: 6</b> <b>Operational Networks: 5</b> <b>On-Net Networks: 3</b>
95. McAllen-Edinburg-Mission, TX	CapRock Communications <b>CLECs: 1</b> <b>Operational Networks: 1</b>	<i>Ionex Telecommunications</i> <b>CLECs: 1</b> <b>On-Net Networks: 1</b>
96. Mobile, AL	e.spire; Hyperion Telecommunications; ITC DeltaCom; <i>Net-Tel Corporation</i> <b>CLECs: 4</b> <b>Operational Networks: 3</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; <i>Birch Telecom</i> ; e.spire; ITC^DeltaCom; Network Telephone; NewSouth Communications; US LEC; Xspedius <b>CLECs: 8</b> <b>Operational Networks: 7</b> <b>On-Net Networks: 1</b>

MSA	CLEC Networks – 1998	CLEC Networks – 2001
97. Vallejo-Fairfield-Napa, CA	Not Available	Not Available
98. New Haven-Meriden, CT	AT&T; Cox Communications; CTC Communications; Intermedia; NorthEast Optic Network Services; <i>RNK</i> <b>CLECs: 6</b> <b>Operational Networks: 6</b> <b>Off-Net Networks: 1</b>	AT&T; Choice One Communications; Conversent Communications; Cox Communications; CTC Communications; PaeTec <b>CLECs: 6</b> <b>Operational Networks: 6</b>
99. Columbia, SC	BTI; e.spire; Intermedia; ITC DeltaCom  <b>CLECs: 4</b> <b>Operational Networks: 4</b>	Adelphia Business Solutions; ALLTEL; <i>Birch Telecom</i> ; BTI; e.spire; Intermedia; ITC^DeltaCom; KMC Telecom; Network Telephone; NewSouth Communications; NuVox Communications; <i>Time Warner Telecom</i> <b>CLECs: 12</b> <b>Operational Networks: 10</b> <b>On-Net Networks: 2</b>
100. Wichita, KS	Advanced Communications Group; Birch Telecom; Hyperion Telecommunications  <b>CLECs: 3</b> <b>Operational Networks: 3</b>	Adelphia Business Solutions; Birch Telecom; Ionex Telecommunications; Logix Communications; NuVox Communications <b>CLECs: 5</b> <b>Operational Networks: 5</b>
101. Colorado Springs, CO	Hyperion Telecommunications; e.spire; <i>Net-Tel Corporation</i> <b>CLECs: 3</b> <b>Operational Networks: 2</b> <b>Off-Net Networks: 1</b>	AT&T; e.spire; ICG Communications; McLeodUSA; SunWest Communications; <i>Vanion</i> <b>CLECs: 6</b> <b>Operational Networks: 6</b> <b>On-Net Networks: 1</b>
102. Worcester, MA-CT	AT&T; NorthEast Optic Network Services  <b>CLECs: 2</b> <b>Operational Networks: 2</b>	<i>AT&amp;T</i> ; Choice One Communications; Conversent Communications; Lightship Telecom; PaeTec <b>CLECs: 5</b> <b>Operational Networks: 5</b> <b>On-Net Networks: 1</b>
103. Fort Wayne, IN	KMC Telecom; US Xchange  <b>CLECs: 2</b> <b>Operational Networks: 2</b> <b>Off-Net Networks: 1</b>	Adelphia Business Solutions; Choice One Communications; KMC Telecom <b>CLECs: 3</b> <b>Operational Networks: 3</b>
104. Melbourne, Titusville, Palm Bay, FL		<i>Florida Digital Network</i> ; ITC^DeltaCom; NewSouth Communications <b>CLECs: 3</b> <b>Operational Networks: 4</b> <b>On-Net Networks: 2</b>
105. Lakeland-Winter Haven, FL		NewSouth Communications <b>CLECs: 1</b> <b>Operational Networks: 1</b>
106. Daytona Beach, FL	Intermedia; KMC Telecom  <b>CLECs: 2</b> <b>Operational Networks: 2</b>	<i>Florida Digital Network</i> ; Intermedia; ITC^DeltaCom; KMC Telecom; NewSouth Communications; PaeTec; <i>US LEC</i> <b>CLECs: 7</b> <b>Operational Networks: 6</b> <b>On-Net Networks: 2</b>



MSA	CLEC Networks – 1998	CLEC Networks – 2001
107. Johnson City-Kingsport-Bristol, TN-VA	NA Communications; <i>Net-Tel Corporation</i> ; P.V. Telecommunications <b>CLECs: 3</b> <b>Operational Networks: 2</b> <b>Off-Net Networks: 1</b>	<i>US LEC</i> <b>CLECs: 1</b> <b>Operational Networks: 1</b> <b>On-Net Networks: 1</b>
108. Lexington, KY	e.spire; Hyperion Telecommunications  <b>CLECs: 2</b> <b>Operational Networks: 2</b>	Adelphia Business Solutions; Duro Communications; e.spire; ICG Communications; <i>Lightyear Communications</i> ; NewSouth Communications; NuVox Communications <b>CLECs: 7</b> <b>Operational Networks: 7</b> <b>On-Net Networks: 1</b>
109. Lancaster, PA	Conectiv Communications; CTSI; Hyperion Telecommunications; NEXTLINK Communications (XO) <b>CLECs: 4</b> <b>Operational Networks: 4</b>	Adelphia Business Solutions; CTSI; XO <b>CLECs: 3</b> <b>Operational Networks: 3</b>
110. Augusta-Aiken, GA	Intermedia; ITC DeltaCom; KMC Telecom; Knology Holdings; <i>Net-Tel Corporation</i> <b>CLECs: 5</b> <b>Operational Networks: 4</b> <b>Off-Net Networks: 1</b>	ALLTEL; <i>Birch Telecom</i> ; Intermedia; <i>ITC^DeltaCom</i> ; KMC Telecom; <i>Knology Broadband</i> ; <i>NewSouth Communications</i> <b>CLECs: 7</b> <b>Operational Networks: 6</b> <b>On-Net Networks: 6</b>
111. Chattanooga TN-GA	AT&T; e.spire; Intermedia; <i>WinStar</i>  <b>CLECs: 4</b> <b>Operational Networks: 3</b> <b>Off-Net Networks: 1</b>	AT&T; <i>Birch Telecom</i> ; BTI; e.spire; Intermedia; <i>ITC^DeltaCom</i> ; KMC Telecom; Network Telephone; <i>NewSouth Communications</i> ; US LEC <b>CLECs: 10</b> <b>Operational Networks: 9</b> <b>On-Net Networks: 3</b>
112. Lansing-East Lansing, MI	<i>Net-Tel Corporation</i> ; WorldCom  <b>CLECs: 2</b> <b>Operational Networks: 1</b> <b>Off-Net Networks: 1</b>	Choice One Communications; KMC Telecom; TDS Metrocom; WorldCom <b>CLECs: 4</b> <b>Operational Networks: 4</b>
113. Kalamazoo-Battle Creek, MI	CTS Telecom; US Xchange  <b>CLECs: 2</b> <b>Operational Networks: 6</b>	Choice One Communications; CTS Telecom; TDS Metrocom <b>CLECs: 3</b> <b>Operational Networks: 3</b>
114. Santa Rosa, CA	ICG Communications <b>CLECs: 1</b> <b>Operational Networks: 1</b>	Advanced TelCom Group; <i>ICG Communications</i> <b>CLECs: 2</b> <b>Operational Networks: 4</b> <b>On-Net Networks: 1</b>
115. Des Moines, IA	Convergent Communications; McLeodUSA <b>CLECs: 2</b> <b>Operational Networks: 2</b>	AT&T; Hickory Tech; McLeodUSA <b>CLECs: 3</b> <b>Operational Networks: 6</b>
116. Bridgeport, CT	AT&T; Cablevision Lightpath; CTC Communications; NorthEast Optic Network Services; <i>RNK</i> <b>CLECs: 5</b> <b>Operational Networks: 4</b> <b>Off-Net Networks: 1</b>	<i>Cablevision Lightpath</i> ; CTC Communications; IntelliSpace  <b>CLECs: 3</b> <b>Operational Networks: 2</b> <b>On-Net Networks: 1</b>